



MEMO

To: Mayor McClure and Members of City Council

From: Katie Towns, Interim Director of Health

Date: March 5, 2021

Re: Next Steps on the Road to Recovery

Overview

The City of Springfield instituted Stay at Home Orders that began on March 26, 2020 and were in place until May 3, 2020. May 4 marked the beginning of the City's phased Road to Recovery Plan. This plan outlined steps to the methodical reopening of our economy, while also implementing policies to protect residents from COVID-19.

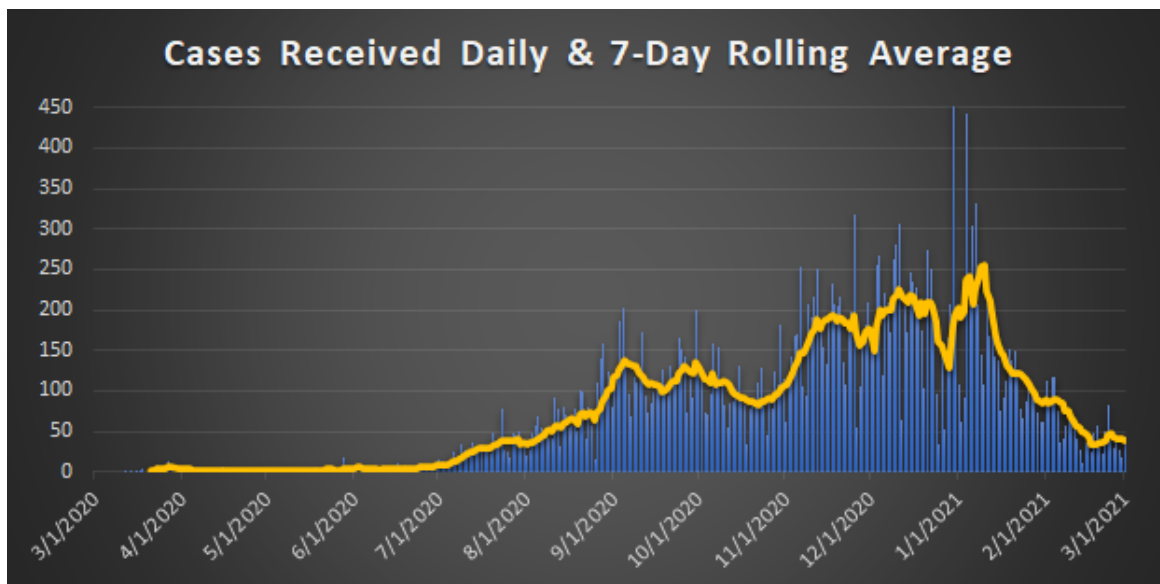
Since July 15, we have been operating under evolving stages of Phase 3 of Springfield's Road to Recovery Plan. Under the current phase—Phase 3C—these orders maintained COVID-19 prevention restrictions such as masking and limits of 50% occupancy in areas of public accommodation based on square footage, which allows for proper physical distancing (Appendix A).

This existing ordinance will expire on April 9 if no action is taken by City Council. It is the firm recommendation of the Springfield-Greene County Health Department (SGCHD) that restrictions remain in place. The SGCHD also recommends adopting an approach, presented herein, to continuing on the Road to Recovery. The approach uses key data elements to guide recommendations to reducing restrictions within the ordinance.

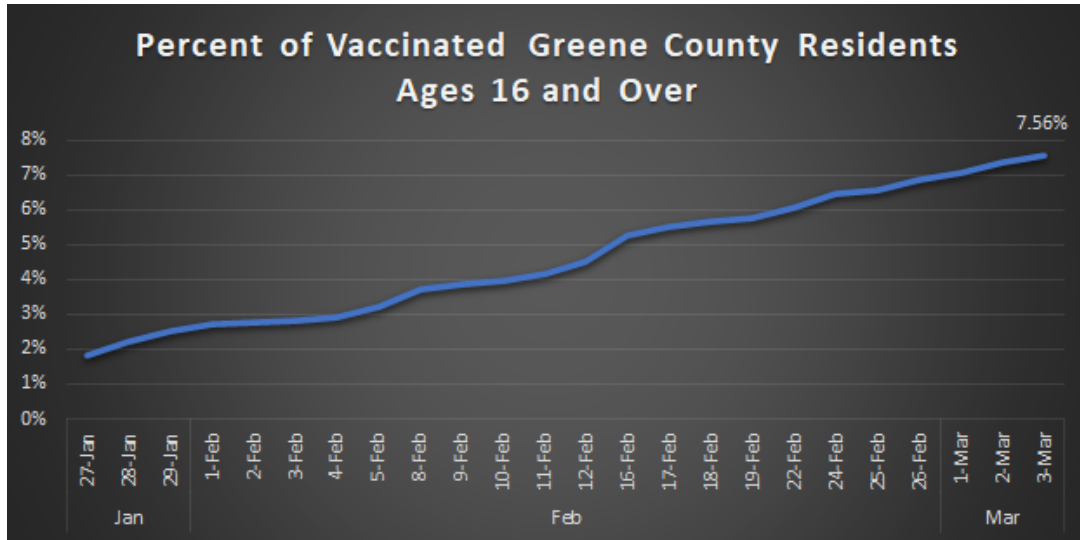
COVID-19 Cases and Current Status

Throughout the course of the pandemic, the SGCHD has worked tirelessly to respond to an ever-evolving situation. As our community crosses the threshold of one year of responding to COVID-19, briefly summarizing the disease and the corresponding response proves difficult. During the first four months of the pandemic, Springfield and Greene County proved to be better able to nimbly respond to and contain the virus than any other city in the Midwest. In July, the number of cases and unknown exposure sources exceeded public health capabilities, which sparked an increase in cases. From the beginning of July through early October, the community experienced steady growth in cases followed by sustained high case counts. During this period, the public health system was unable to meet the demands of new cases. After a brief reduction in cases (yet still high case volumes), the trend once again rapidly grew and maintained extremely high case counts, peaking on January 10th at 254 cases. During this

surge, the hospitals were extremely taxed, and both public health and healthcare adapted to the increasing volume to continue to respond. Since peaking in early January, cases have sharply declined. In comparing the first of each month, January's 7-day average case count was 203, February's was 89 and in March it has dropped to 39. During this period, hospitals have also experienced a significant reduction in hospitalizations, with 230 people hospitalized for COVID-19 in early January, 113 February 1st, and 53 on March 1st.



During the first several months of vaccine implementation, the community has begun to gain some momentum. Presently, more than 7% of Greene County's eligible population (16 and older population) have been fully vaccinated.



After the slow start, vaccine supply and ordering cadence is beginning to take place for the community's hospitals and public health. This is allowing for a more methodical approach to implementing local efforts to vaccinate. As vaccine supply increases over the month of March, there will be an increasing number of vaccinators who will begin to be able to regularly contribute to the effort.

Continued case for masking

Masking continues to be one of the strongest tools against COVID-19 while also allowing the economy to reopen. It is the recommendation of the SGCHD that masking be one of the last restrictions to be eased as a result.

The March 5, 2021 [Morbidity and Mortality Report from CDC](#) studied the effectiveness of mask mandates in 39 states and the District of Columbia. To analyze the impact of the implementation of the mask mandate, scientists gathered data on the 20 days prior to implementation and the 100 days following the start of the mask mandate. Researchers found that masking decreased daily COVID-19 case growth by 0.5 percentage points within the first 20 days following implementation, and the impact of masking continued to grow—case growth decreased by 1.1 percentage points 40 days out, 1.5 points 60 days out, 1.7 points 80 days out and 1.8 points by the 100th day of the mask mandate. Deaths similarly slowed, by 0.7, 1.0, 1.4, 1.6 and 1.9 percentage points in the same timeframes.

Another example of the power of masking has been in the continued low case rate among school-age children locally. The case rate among this age group has remained steady and low,

even when four-day school weeks was instituted, demonstrating that masking, along with comprehensive mitigation strategies in school settings, can prevent widespread transmission.

Additional studies have continued to point to the importance of masking to protect against COVID-19 transmission. A February 10 analysis in the [Journal of the American Medical Association](#) reviewed 11 studies around masking and found evidence of a substantial decrease in risk of COVID-19 infection with every example.

The [CDC continues to point to now 45 studies](#) (Appendix B) which support the emerging evidence that cloth face coverings reduce the likelihood of spreading respiratory droplets when properly worn over the nose and mouth.

Potential Variants

Due to the emergence of several variants of COVID-19, continued compliance with public health mitigation strategies, such as vaccination, physical distancing, use of masks, hand hygiene, and isolation and quarantine, is essential to limit the spread of the virus that causes COVID-19 and protect public health.

Multiple variants of the virus that causes COVID-19 are circulating globally. The United Kingdom (UK) identified [a variant called B.1.1.7](#) with a large number of mutations in the fall of 2020. [Epidemiological studies](#) indicate that the B.1.1.7/201/501Y.V1 strain is 30% to 80% more effectively transmitted and results in higher nasopharyngeal viral loads than the wild-type strain of SARS-CoV. Also of concern are retrospective observational studies suggesting an approximately 30% increased risk of death associated with this variant.

In South Africa, [another variant called B.1.351](#) emerged independently of B.1.1.7, where it has rapidly become the predominant strain. This strain is also thought to also have a high potential for transmission.

Framework removing COVID-related restrictions

As our community's vaccination rate, confirmed cases and hospitalization rates continue to improve, the Health Department believes that the community can use a data driven approach to begin to step out of restrictions in a way that protects the health of our community and also allows for more economic activity.

To guide the process and provide recommendations towards reducing restrictions, the SGCHD has developed a framework to use data to inform City Council. This framework is built on recommendations from the White House Coronavirus Task Force and [the Missouri Department of Health and Senior Services: State of Missouri Public Health Warning](#). Additionally, the approach will remain flexible and will be adapted as new information becomes available. The

proposed indicators consider where we are in Springfield's Road to Recovery Plan Phase 3C, the data and trends we are monitoring, and what thresholds best indicate a readiness to step out of the ordinance.

Three key indicators will drive the recommendations from SGCHD:

- 7-day average case count,
- hospitalizations due to COVID-19, and
- percent of the eligible population that has been fully vaccinated.

These three indicators best capture the current impact of COVID-19 in our community and progress towards broad-based community protection. The evaluation period will be 28 days (two full incubation periods of the virus), when considering moving into the next step of the Road to Recovery. Allowing two incubation periods to pass before making changes to the ordinance will increase confidence in sustained trends, protect against short-term variances, and give the community time to anticipate how ordinances will change.

RED	YELLOW	GREEN
WHEN these thresholds are met: <ul style="list-style-type: none"> • New cases per day: More than 40 cases (based on 7-day average) • Hospitalizations - COVID-19 isolation: Over 50 • Percent of residents vaccinated (about 238,871 residents 16 and over): N/A 	WHEN these thresholds are met: <ul style="list-style-type: none"> • New cases per day: Under 40 cases • Hospitalizations - COVID-19 isolation: Under 50 • Percent of residents vaccinated (about 238,871 residents 16 and over): 25% 	WHEN these thresholds are met: <ul style="list-style-type: none"> • New cases per day: Under 20 cases • Hospitalizations - COVID-19 isolation: Under 20 • Percent of eligible residents vaccinated (about 238,871 residents 16 and over): 50%
THEN the ordinance will include: <ul style="list-style-type: none"> • Occupancy limit: Keep existing restrictions (50% occupancy limit) • Masking: Required • Physical Distancing: Required 	THEN the ordinance will include: <ul style="list-style-type: none"> • Occupancy limit: Remove most occupancy restrictions • Masking: Required • Physical Distancing: Recommended • Mass gatherings: Under 500 allowed—masking and distancing recommended Over 500 allowed at 50% capacity—masking and distancing recommended 	THEN the ordinance will be removed. <ul style="list-style-type: none"> • Public health recommendations may apply.

Source: MO DHSS: State of Missouri Public Health Warning, White House Coronavirus Task Force Report and [CDC Mitigation Framework](#)

Indicators and Thresholds

Moving from red, to yellow, to green will be a stepwise approach, with a goal that all three conditions be met to move closer towards the end of the Road to Recovery. However, the minimum expectation will be that two of the three conditions are met with the third showing strong progress towards being met. In order to progress from red to the yellow, the 7-day average case count will need to be below 40 cases per day for a 28-day period. A 7-day average is used to account for inconsistent reporting days due to testing and when cases are reported to the state. To consider lifting restrictions to the ordinance, a 28-day maintenance of the 7-day average in the threshold should be observed. If during the 28-day period, the 7-day average rises above 40 cases per day threshold, the SGCHD may still recommend progressing to the next phase. These recommendations will be limited to when 7-day averages are below the threshold for at least 80% (23 days), and the rise of the 7-day average into the higher threshold does not exceed 20% (5 days) of total evaluation period (28 days). The evaluation period will be a rolling 28 days and should be adjusted accordingly in the case that more than 5 days are above the threshold.

If, after progressing to the next phase in the Road to Recovery (e.g. yellow or green), any of the three indicators worsen, regressing to one of the previous categories, the SGCHD currently recommends their exploration into the reasons behind the change and will present findings to City Council before stepping back into additional restrictions.

In evaluating both hospitalizations and vaccinations, if the data do not meet the thresholds, additional exploration into the data and partnership with healthcare will occur. Based on information, the SGCHD will make recommendations to City Council.

Recommended Ordinance Changes

With each step forward on the Road to Recovery, the restrictions will be lessened. These steps are subsequent to reduced disease and improved community immunity achieved through vaccinations. There are three primary components to the ordinance that will be addressed in the change: occupancy limitations, masking, and physical distancing.

Within the current phase of the Road to Recovery (Phase 3C), occupancy restrictions are established at 50% within facilities and other criteria apply to other activities. The proposed framework removes the occupancy limitations and other requirements for the majority of facilities in both the yellow and green phases. Some high-risk elements will remain, such as the prohibition of bar and counter seating. Within the yellow phase the recommendation also includes limiting the number of people in mass gatherings. This public health recommendation is in place to help reduce the likelihood of a “super spreader” event that may be more likely to

occur with variants that are more transmissible. In the face of uncertain vaccine efficacy against all variants of COVID-19, limiting the number of people who can closely congregate for an extended period of time is necessary. The recommendation, which maintains 50% of occupancy, applies only to facilities when there are 500 people or more. This recommendation is currently only planned in the yellow phase and would be removed in the green phase.

Masking is required, with certain exceptions, within the current ordinance. During the yellow phase, the recommendation for this requirement will continue. This recommendation persists due to both the effectiveness of masks in limiting disease transmission and the minimal economic impact on the community. The Green phase will include the removal of the requirement of masking and will transition to the recommendation for continued masking.

Lastly, physical distancing is currently required within existing ordinance. As the community moves from Red into the next phases of recovery, the requirement will be removed and instead will be a recommendation. The lessening of the requirement is based on the inability to ensure distancing is maintained as occupancy restrictions are removed. Physical distancing will still be recommended to minimize exposures to the virus.

The indicators and recommendations made are based on the best evidence currently available. As the SGCHD learns more from not only local experience, but as data and evidence emerge from additional research, updated recommendations to the approach may occur.

Taking a measured approach to the final stages of the Road to Recovery, being guided by key community indicators, will help ensure that the community finishes the recovery, while protecting the health of the community. During these final stages in the community's response to COVID-19, it is paramount that the effective approaches to reducing disease transmission are maintained. These, in combination with a growing vaccination rate will help the community finish strong!



Appendix A

SPRINGFIELD-GREENE COUNTY ROAD TO RECOVERY PLAN (UPDATED 12.15.2020)

Phases 3A-3C are extensions of Phase 3 with the addition of a masking ordinance

PHASE 3A-3C (JULY 16-APRIL 9, 2021)

Phase 3B increased the occupancy limitation at Public Gatherings. Phase 3C added an exemption for baptisms.

RESTAURANTS & BARS	ENTERTAINMENT VENUES & MUSEUMS	PLAYGROUNDS, POOLS & PARKS	SPORTS & SPORTING EVENTS	RETAIL STORES/ BUSINESSES	PERSONAL CARE SERVICES ¹⁾	GYMS & FITNESS CENTERS	CHILD CARE, CAMPS & PRIVATE SCHOOLS	RELIGIOUS SERVICES, WEDDINGS & FUNERALS	PUBLIC GATHERINGS
<p>Restaurants: Face coverings are required for staff at all times. Patrons must wear masks when not eating or drinking. Tables must be 6 feet apart.</p> <p>Bars, nightclubs and tap rooms: 50% occupancy limitation based on square footage* of facility or 35 people, whichever is greater. Masks required for both staff and patrons unless eating or drinking.</p> <p>No counter seating or self-service buffets allowed</p>	<p>Allowed to operate with 50% occupancy limitation based on square footage* of facility or 35 people whichever is greater</p> <p>Face Coverings are required for all staff and patrons in public areas and while preparing food and drinks</p> <p>Face Coverings are not required of speakers or performers addressing or performing for a group.</p>	<p>Playgrounds, Parks and Trails open</p> <p>Pools allowed to operate with 50% bather load of the pool</p>	<p>Persons playing a sport are not required to wear a face covering</p> <p>Spectators allowed with 50% occupancy limitation based on square footage* of spectator area</p> <p>Outdoor sporting events and practices: Masks required for spectators if physical distancing of 6 feet can't be maintained.</p> <p>Indoor sporting events and practices: Masks required for spectators</p> <p><i>Umpires, referees, and coaches are not considered spectators</i></p>	<p>Open with 50% occupancy limitation based on square footage* or 35 people, whichever is greater</p> <p>Face Coverings are required for both staff and patrons in public areas.</p>	<p>Open with 50% occupancy limitation based on square footage* (includes employees)</p> <p>Face Coverings are required for both staff and patrons</p>	<p>Open with 50% occupancy limitation based on square footage*</p> <p>Fitness classes allowed to operate with 50% occupancy limitation based on square footage* of facility or 35 people whichever is greater</p> <p>Face Coverings required for both staff and patrons in public areas unless the person is playing a sport, exercising or using exercise equipment while exerting themselves</p>	<p>Day cares and schools open</p> <p>Day camps open with limitations of stable groups of 25</p> <p>Face Coverings required for all providers of day cares, day camps, and childcare programs.</p> <p><i>Children ages 3 to 11 are strongly encouraged, but not required to wear a Face Covering, while under the direct supervision of an adult.</i></p>	<p>In-Person services allowed to operate with 50% occupancy limitation based on square footage* of facility or 35 people whichever is greater</p> <p>Face Coverings required for both staff and patrons/ visitors except while eating or drinking or while addressing or performing for a group.</p> <p>Weddings: masks are not required for the wedding party during the ceremony or while photos are being taken.</p> <p>Participants in a baptism ceremony are not required to wear a Face Covering during a baptism ceremony or while photographs of the baptism are taken. <i>(Exemption added Dec. 15)</i></p>	<p>The City is permitting special events on public property with a 50% occupancy limitation based on the square footage* of the area. <i>(Amended on Oct. 12 from a 25% occupancy limitation)</i></p> <p>All providers of a Special Event shall require Face Coverings of staff and participants</p>

ALL BUSINESSES SHALL CARRY OUT TO THE GREATEST DEGREE POSSIBLE CDC RECOMMENDED SOCIAL DISTANCING AND CLEANING GUIDELINES IN ALL SITUATIONS.

FACE COVERINGS/MASKS ARE REQUIRED IN MOST PUBLIC PLACES. PLEASE SEE THE ORDER OR PAGE 3 OF THE ROAD TO RECOVERY DOCUMENT PLAN FOR MORE INFORMATION.

***50% Occupancy Square Footage Formula:** (Square Footage)/30 x .50 = Occupancy Limit

1) Personal care services include, but are not limited to, barbers, hairdressers, manicurists, estheticians, piercing technicians, tattoo artists, and massage therapists.

19

Appendix B

1. Moghadas SM, Fitzpatrick MC, Sah P, et al. The implications of silent transmission for the control of COVID-19 outbreaks. *Proc Natl Acad Sci U S A*. 2020;117(30):17513-17515.10.1073/pnas.2008373117. <https://www.ncbi.nlm.nih.gov/pubmed/32632012external icon>.
2. Johansson MA, Quandelacy TM, Kada S, et al. Controlling COVID-19 requires preventing SARS-CoV-2 transmission from people without symptoms. *Submitted*. 2020.
3. Lindsley WG, Blachere FM, Law BF, Beezhold DH, Noti JD. Efficacy of face masks, neck gaiters and face shields for reducing the expulsion of simulated cough-generated aerosols. *medRxiv*. 2020. <https://doi.org/10.1101/2020.10.05.20207241external icon>.
4. Fischer EP, Fischer MC, Grass D, Henrion I, Warren WS, Westman E. Low-cost measurement of face mask efficacy for filtering expelled droplets during speech. *Sci Adv*. 2020;6(36).10.1126/sciadv.abd3083. <https://www.ncbi.nlm.nih.gov/pubmed/32917603external icon>.
5. Verma S, Dhanak M, Frankenfield J. Visualizing the effectiveness of face masks in obstructing respiratory jets. *Phys Fluids* (1994). 2020;32(6):061708.10.1063/5.0016018. <https://www.ncbi.nlm.nih.gov/pubmed/32624649external icon>.
6. Bahl P, Bhattacharjee S, de Silva C, Chughtai AA, Doolan C, MacIntyre CR. Face coverings and mask to aerosol droplet dispersion and aerosolisation: a video case study. *Thorax*. 2020;75(11):1024-1025.10.1136/thoraxjnl-2020-215748. <https://www.ncbi.nlm.nih.gov/pubmed/32709611external icon>.
7. Davies A, Thompson KA, Giri K, Kafatos G, Walker J, Bennett A. Testing the efficacy of homemade masks: would they protect in an influenza pandemic? *Disaster Med Public Health Prep*. 2013;7(4):413-418.10.1017/dmp.2013.43. <https://www.ncbi.nlm.nih.gov/pubmed/24229526external icon>.
8. Leung NHL, Chu DKW, Shiu EYC, et al. Respiratory virus shedding in exhaled breath and efficacy of face masks. *Nature Medicine*. 2020;26(5):676-680.<https://dx.doi.org/10.1038/s41591-020-0843-2external icon>.
9. Bandiera L., Pavar G., Pisetta G., et al. Face coverings and respiratory tract droplet dispersion. *medRxiv*. 2020.10.1101/2020.08.11.20145086. <https://doi.org/10.1101/2020.08.11.20145086external icon>.
10. Alsved M, Matamis A, Bohlin R, et al. Exhaled respiratory particles during singing and talking. *Aerosol Sci Technol*. 2020.10.1080/02786826.2020.1812502.
11. Asadi S, Wexler AS, Cappa CD, Barreda S, Bouvier NM, Ristenpart WD. Aerosol emission and superemission during human speech increase with voice loudness. *Sci Rep*. 2019;9(1):2348.10.1038/s41598-019-38808-z. <https://www.ncbi.nlm.nih.gov/pubmed/30787335external icon>.
12. Morawska L., Johnson GR, Ristovski ZD, et al. Size distribution and sites of origin of droplets expelled from the human respiratory tract during expiratory activities. *Aerosol Sci*. 2009;40(3):256-269. <https://www.sciencedirect.com/science/article/pii/S0021850208002036external icon>.
13. Abkarian M, Mendez S, Xue N, Yang F, Stone HA. Speech can produce jet-like transport relevant to asymptomatic spreading of virus. *Proc Natl Acad Sci U S A*. 2020;117(41):25237-25245.10.1073/pnas.2012156117. <https://www.ncbi.nlm.nih.gov/pubmed/32978297external icon>.
14. Ueki H, Furusawa Y, Iwatsuki-Horimoto K, et al. Effectiveness of Face Masks in Preventing Airborne Transmission of SARS-CoV-2. *mSphere*. 2020;5(5).10.1128/mSphere.00637-20. <https://www.ncbi.nlm.nih.gov/pubmed/33087517external icon>.
15. Rodriguez-Palacios A, Cominelli F, Basson AR, Pizarro TT, Ilic S. Textile Masks and Surface Covers-A Spray Simulation Method and a "Universal Droplet Reduction Model" Against Respiratory Pandemics. *Front Med (Lausanne)*. 2020;7:260.10.3389/fmed.2020.00260. <https://www.ncbi.nlm.nih.gov/pubmed/32574342external icon>.
16. Viola I.M., Peterson B., Pisetta G., et al. Face coverings, aerosol dispersion and mitigation of virus transmission risk. 2020. <https://arxiv.org/abs/2005.10720external icon>.
17. Rengasamy S, Eimer B, Shaffer RE. Simple respiratory protection—evaluation of the filtration performance of cloth masks and common fabric materials against 20-1000 nm size particles. *Ann Occup Hyg*. 2010;54(7):789-798.10.1093/annhyg/meq044. <https://www.ncbi.nlm.nih.gov/pubmed/20584862external icon>.

18. Konda A, Prakash A, Moss GA, Schmoldt M, Grant GD, Guha S. Aerosol Filtration Efficiency of Common Fabrics Used in Respiratory Cloth Masks. *ACS Nano*. 2020;14(5):6339-6347.10.1021/acsnano.0c03252. <https://www.ncbi.nlm.nih.gov/pubmed/32329337>[external icon](#).
19. Long KD, Woodburn EV, Berg IC, Chen V, Scott WS. Measurement of filtration efficiencies of healthcare and consumer materials using modified respirator fit tester setup. *PLoS One*. 2020;15(10):e0240499.10.1371/journal.pone.0240499. <https://www.ncbi.nlm.nih.gov/pubmed/33048980>[external icon](#).
20. O'Kelly E, Pirog S, Ward J, Clarkson PJ. Ability of fabric face mask materials to filter ultrafine particles at coughing velocity. *BMJ Open*. 2020;10(9):e039424.10.1136/bmjopen-2020-039424. <https://www.ncbi.nlm.nih.gov/pubmed/32963071>[external icon](#).
21. Aydin O, Emon B, Cheng S, Hong L, Chamorro LP, Saif MTA. Performance of fabrics for home-made masks against the spread of COVID-19 through droplets: A quantitative mechanistic study. *Extreme Mech Lett*. 2020;40:100924.10.1016/j.eml.2020.100924. <https://www.ncbi.nlm.nih.gov/pubmed/32835043>[external icon](#).
22. Bhattacharjee S, Bahl P, Chughtai AA, MacIntyre CR. Last-resort strategies during mask shortages: optimal design features of cloth masks and decontamination of disposable masks during the COVID-19 pandemic. *BMJ Open Respir Res*. 2020;7(1).10.1136/bmjresp-2020-000698. <https://www.ncbi.nlm.nih.gov/pubmed/32913005>[external icon](#).
23. Maurer L, Peris D, Kerl J, Guenther F, Koehler D, Dellweg D. Community Masks During the SARS-CoV-2 Pandemic: Filtration Efficacy and Air Resistance. *J Aerosol Med Pulm Drug Deliv*. 2020.10.1089/jamp.2020.1635. <https://www.ncbi.nlm.nih.gov/pubmed/32975460>[external icon](#).
24. Hill WC, Hull MS, MacCuspie RI. Testing of Commercial Masks and Respirators and Cotton Mask Insert Materials using SARS-CoV-2 Virion-Sized Particulates: Comparison of Ideal Aerosol Filtration Efficiency versus Fitted Filtration Efficiency. *Nano Lett*. 2020;20(10):7642-7647.10.1021/acs.nanolett.0c03182. <https://www.ncbi.nlm.nih.gov/pubmed/32986441>[external icon](#).
25. Whiley H, Keerthirathne TP, Nisar MA, White MAF, Ross KE. Viral Filtration Efficiency of Fabric Masks Compared with Surgical and N95 Masks. *Pathogens*. 2020;9(9).10.3390/pathogens9090762. <https://www.ncbi.nlm.nih.gov/pubmed/32957638>[external icon](#).
26. Hao W, Parasch A, Williams S, et al. Filtration performances of non-medical materials as candidates for manufacturing facemasks and respirators. *Int J Hyg Environ Health*. 2020;229:113582.10.1016/j.ijheh.2020.113582. <https://www.ncbi.nlm.nih.gov/pubmed/32917368>[external icon](#).
27. van der Sande M, Teunis P, Sabel R. Professional and home-made face masks reduce exposure to respiratory infections among the general population. *PLoS One*. 2008;3(7):e2618.10.1371/journal.pone.0002618. <https://www.ncbi.nlm.nih.gov/pubmed/18612429>[external icon](#).
28. Chu DK, Akl EA, Duda S, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *Lancet*. 2020.10.1016/S0140-6736(20)31142-9. [https://doi.org/10.1016/S0140-6736\(20\)31142-9](https://doi.org/10.1016/S0140-6736(20)31142-9)[external icon](#).
29. Clase CM, Fu EL, Ashur A, et al. Forgotten Technology in the COVID-19 Pandemic: Filtration Properties of Cloth and Cloth Masks-A Narrative Review. *Mayo Clin Proc*. 2020;95(10):2204-2224.10.1016/j.mayocp.2020.07.020. <https://www.ncbi.nlm.nih.gov/pubmed/33012350>[external icon](#).
30. Zhao M, Liao L, Xiao W, et al. Household Materials Selection for Homemade Cloth Face Coverings and Their Filtration Efficiency Enhancement with Triboelectric Charging. *Nano Lett*. 2020;20(7):5544-5552.10.1021/acs.nanolett.0c02211. <https://www.ncbi.nlm.nih.gov/pubmed/32484683>[external icon](#).
31. Parlin AF, Stratton SM, Culley TM, Guerra PA. A laboratory-based study examining the properties of silk fabric to evaluate its potential as a protective barrier for personal protective equipment and as a functional material for face coverings during the COVID-19 pandemic. *PLoS One*. 2020;15(9):e0239531.10.1371/journal.pone.0239531. <https://www.ncbi.nlm.nih.gov/pubmed/32946526>[external icon](#).
32. Hendrix MJ, Walde C, Findley K, Trotman R. Absence of Apparent Transmission of SARS-CoV-2 from Two Stylists After Exposure at a Hair Salon with a Universal Face Covering Policy – Springfield, Missouri, May 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(28):930-932.10.15585/mmwr.mm6928e2. <https://www.ncbi.nlm.nih.gov/pubmed/32673300>[external icon](#).

33. Wang Y, Tian H, Zhang L, et al. Reduction of secondary transmission of SARS-CoV-2 in households by face mask use, disinfection and social distancing: a cohort study in Beijing, China. *BMJ Glob Health*. 2020;5(5).10.1136/bmjgh-2020-002794. <https://www.ncbi.nlm.nih.gov/pubmed/32467353>[external icon](#).
34. Doung-Ngern P, Suphanchaimat R, Panjangampattana A, et al. Case-Control Study of Use of Personal Protective Measures and Risk for Severe Acute Respiratory Syndrome Coronavirus 2 Infection, Thailand. *Emerg Infect Dis*. 2020;26(11).10.3201/eid2611.203003. <https://www.ncbi.nlm.nih.gov/pubmed/32931726>[external icon](#).
35. Payne DC, Smith-Jeffcoat SE, Nowak G, et al. SARS-CoV-2 Infections and Serologic Responses from a Sample of U.S. Navy Service Members – USS Theodore Roosevelt, April 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(23):714-721.10.15585/mmwr.mm6923e4. <https://www.ncbi.nlm.nih.gov/pubmed/32525850>[external icon](#).
36. Schwartz KL, Murti M, Finkelstein M, et al. Lack of COVID-19 transmission on an international flight. *Cmaj*. 2020;192(15):E410.10.1503/cmaj.75015. <https://www.ncbi.nlm.nih.gov/pubmed/32392504>[external icon](#).
37. Freedman DO, Wilder-Smith A. In-flight Transmission of SARS-CoV-2: a review of the attack rates and available data on the efficacy of face masks. *J Travel Med*. 2020.10.1093/jtm/taaa178. <https://www.ncbi.nlm.nih.gov/pubmed/32975554>[external icon](#).
38. Wang X, Ferro EG, Zhou G, Hashimoto D, Bhatt DL. Association Between Universal Masking in a Health Care System and SARS-CoV-2 Positivity Among Health Care Workers. *JAMA*. 2020.10.1001/jama.2020.12897. <https://www.ncbi.nlm.nih.gov/pubmed/32663246>[external icon](#).
39. Mitze T., Kosfeld R., Rode J., Wälde K. *Face Masks Considerably Reduce COVID-19 Cases in Germany: A Synthetic Control Method Approach*. IZA – Institute of Labor Economics (Germany);2020.ISSN: 2365-9793, DP No. 13319. <http://ftp.iza.org/dp13319.pdf>[pdf icon](#)[external icon](#)
40. Gallaway MS, Rigler J, Robinson S, et al. Trends in COVID-19 Incidence After Implementation of Mitigation Measures – Arizona, January 22–August 7, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(40):1460-1463.10.15585/mmwr.mm6940e3. <https://www.ncbi.nlm.nih.gov/pubmed/33031366>[external icon](#).
41. Lyu W, Wehby GL. Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US. *Health Aff (Millwood)*. 2020;39(8):1419-1425.10.1377/hlthaff.2020.00818. <https://www.ncbi.nlm.nih.gov/pubmed/32543923>[external icon](#).
42. Hatzius J, Struyven D, Rosenberg I. Face Masks and GDP. *Goldman Sachs Research* <https://www.goldmansachs.com/insights/pages/face-masks-and-gdp.html>[external icon](#). Accessed July 8, 2020.
43. Karaivanov A., Lu S.E., Shigeoka H., Chen C., Pamplona S. *Face Masks, Public Policies And Slowing The Spread Of Covid-19: Evidence from Canada* National Bureau Of Economic Research 2020.Working Paper 27891. <http://www.nber.org/papers/w27891>[external icon](#).
44. Chernozhukov V, Kasahara H, Schrimpf P. Causal Impact of Masks, Policies, Behavior on Early Covid-19 Pandemic in the U.S. *medRxiv*. 2020.10.1101/2020.05.27.20115139. <http://medrxiv.org/content/early/2020/05/29/2020.05.27.20115139.abstract>[external icon](#).
45. Leffler CT, Ing EB, Lykins JD, Hogan MC, McKeown CA, Grzybowski A. Association of country-wide coronavirus mortality with demographics, testing, lockdowns, and public wearing of masks (updated August 4, 2020). *medRxiv*. 2020.10.1101/2020.05.22.20109231. <http://medrxiv.org/content/early/2020/05/25/2020.05.22.20109231.abstract>[external icon](#).